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EXAMINER

DWIVEDI, VIKANSHA S

ART UNIT	PAPER NUMBER
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3741

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04/01/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/783,162	Applicant(s) VINSON ET AL.	
	Examiner VIKANSHA S. DWIVEDI	Art Unit 3741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/10/2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 16-21 and 24-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 16-21 and 24-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

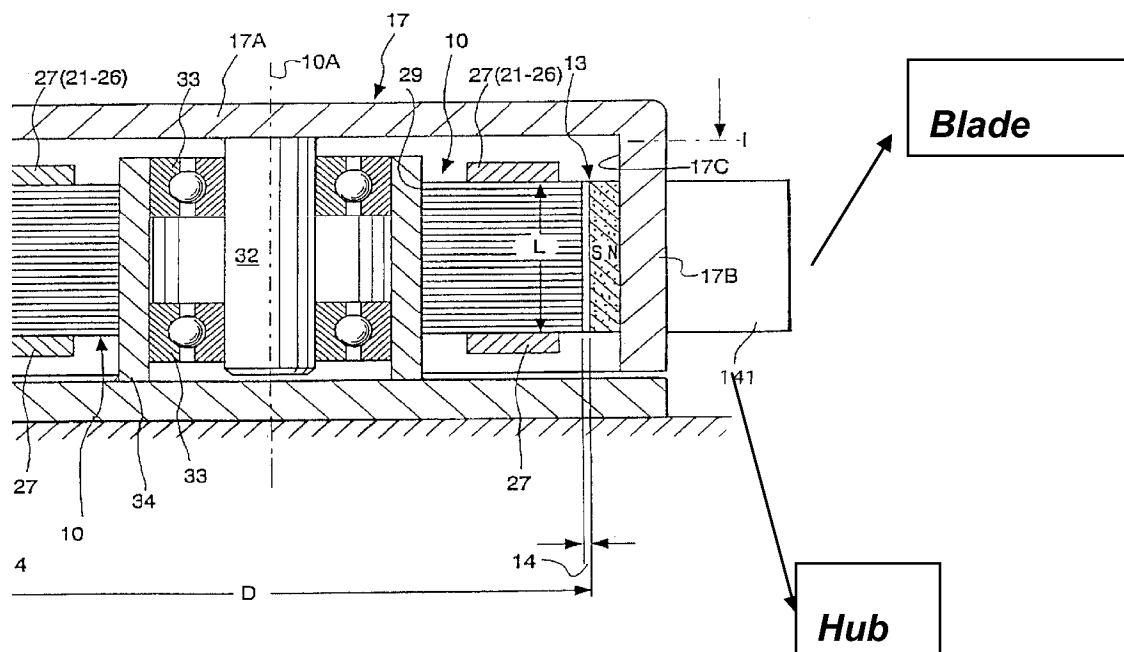
Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide in view of Leupold and in further view of Leupold (U.S. Patent number 5,280,209).

Von der Heide teaches a cooling fan comprising: a three-phase DC motor, an impeller comprising a hub to house said motor and a plurality of blades 141 extending from the hub. It should be clear rotor housing 17 is the hub and has plurality of blades 139 and 141 extending from the hub 17. for applicant's convenience the hub and the Blade are shown below. It is a marked up copy of Von der Heide figure 2.



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It should be clear that a impeller is the rotating part that transmits motion in a device such as a cooling fan. In case of Von der Heide a magnetic external rotor comprises an inverted cup-shaped rotor housing/hub 17 with a horizontal top surface 17A and a cylindrical circumferential wall 17B that supports the blades 139 and 141. Stub shaft 32 is attached to the center of rotor housing 17 at the center of top 17A. Stub shaft 32 rides in ball bearing journals 33 and is supported thereby in a manner that rotor housing 17 is pivotally secured to stator 10 and can rotate about center axis 10A. Von der is silent about the blades being at least 25 % of the impeller diameter. At the time of invention it would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold to increase the durability of the arrangement (col. 1 ll. 55-60). Von der Heide in view of Leupold does not teach a rare earth magnet. Leupold teaches a rare earth magnet. At the time of invention it would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold to produce optimal magnetic fields in electric machinery (Background of Invention).

With regard to claim limitation blades being at least 25 % of the impeller diameter it should be clear that "blades being at least 25 % of the impeller diameter" presents no novel or unexpected result over the blade and impeller diameter relationship (Also, applicant explains on page 10 and 11 of the specification how the blade height ("HB") in the illustrated embodiment is approximately 25 % of the impeller diameter ("I"), as compared to 20 % of the impeller diameter in a fan using a conventional DC motor. This enables the

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impeller 72 to displace a greater amount of air for each rotation of the impeller than an impeller of a comparable fan powered by a conventional DC motor used in the references. Such a relationship between the blade height and the impeller diameter in lieu of those used in the references solves no stated problem and would be an obvious matter of design choice within the skill of the art.

Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide, Yokozawa, Leupold and further in view of Dehmer.

Von der Heide ,in view of Leupold teaches the invention substantially except the chord length. Dehmer teaches blade has a chord profile (Figure 3) that increases in chord length from a region proximate to the hub (bottom of figure 3) to a maximum chord length at a maximum chord length blade height (Figure 3); wherein the maximum chord length blade height is approximately half the full blade height (Figure3, chord length increases towards the middle of the fan and is maximum around the middle); wherein each blade of the impeller has a tip and the chord profile decreases in chord length from the maximum chord length blade height to the tip of the blade (Figure 3 shows , chord length increases towards the middle of the fan and is maximum around the middle and then it decreases towards the upper end that is the tip of the blade). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Dehmer to increase the efficiency by minimize the losses generated by the fluid movement. (Col. 1 ll. 1-5).

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Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide, Leupold and further in view of Bradbury et al. (U.S. 6,129,528).

Von der Heide in view of Leupold teaches the invention substantially except the stagger angle. Bradbury discloses blade that has a tip and the stagger angle of each blade increases from the hub to the tip of the blade (Col. 11 ll. 20-23). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Bradbury to increase the velocities on the surface and thus reducing the local pressure (summary of invention paragraph 19). With respect to claim 6 Von der Heide in view of Leupold and further in view of Bradbury teaches the invention except claimed range, however it fails to patentably distinguish over Von der Heide in view of Leupold and further in view of Bradbury and would have been within the level of one of ordinary skill in the art at the time the invention was made. It has been held that "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), MPEP 2144.05 II.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide, Yokozawa, Leupold and further in view of Harmsen.

Von der Heide in view of Leupold teaches the invention substantially except the camber angle. Harmsen discloses camber angle that decreases from the hub to the tip (Col. 1 ll.

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33-44). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Harmsen as a commonly known feature in the field of invention. (Col. 1 ll. 33-44).

With respect to claim 8 Von der Heide in view of Leupold and further in view of Harmsen teaches the invention except claimed range, however it fails to patentably distinguish over Von der Heide in view of Leupold and further in view of Harmsen and would have been within the level of one of ordinary skill in the art at the time the invention was made. It has been held that “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), MPEP 2144.05 II.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide in view of Leupold and further in view of Neely et al.

Von der Heide in view of Leupold teaches the invention substantially except seven blades. Neely discloses seven blades. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Neely to provide seven blades to increase the performance of the system. (Summary of invention).

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Claim 11, 13, 16, 17, 19, 20, 21, 30, 31, 32, 33, are rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide, Leupold and further in view of Dehmer, Bradbury and Harmsen.

Von der Heide in view of Leupold teaches the invention substantially except the chord length. Dehmer teaches blade has a chord profile (Figure 3) that increases in chord length from a region proximate to the hub (bottom of figure 3) to a maximum chord length at a maximum chord length blade height (Figure 3); wherein the maximum chord length blade height is approximately half the full blade height (Figure 3, chord length increases towards the middle of the fan and is maximum around the middle); wherein each blade of the impeller has a tip and the chord profile decreases in chord length from the maximum chord length blade height to the tip of the blade (Figure 3 shows , chord length increases towards the middle of the fan and is maximum around the middle and then it decreases towards the upper end that is the tip of the blade). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Dehmer to increase the efficiency by minimize the losses generated by the fluid movement. (Col. 1 ll. 1-5). Von der Heide in view of Leupold teaches the invention substantially except the stagger angle. Bradbury discloses blade that has a tip and the stagger angle of each blade increases from the hub to the tip of the blade (summary of invention paragraph 17). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Bradbury to increase the velocities on the surface and thus reducing the local pressure (summary of invention paragraph 19). Von

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der Heide in view of Leupold teaches the invention substantially except the camber angle. Harmsen discloses camber angle that decreases from the hub to the tip (Col. 1 ll. 33-44). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Harmsen as a commonly known feature in the field of invention. (Col. 1 ll. 33-44).

With respect to claim 13 Dehmer teaches blade has a chord profile (Figure 3) that increases in chord length from a region proximate to the hub (bottom of figure 3) to a maximum chord length at a maximum chord length blade height (Figure 3); wherein the maximum chord length blade height is approximately half the full blade height (Figure 3, chord length increases towards the middle of the fan and is maximum around the middle) or in other words located at **approximately** forty percent of the blade height.

Heide, in view of Leupold and further in view of Bradbury and Harmsen discloses the general conditions of the claimed invention except for the express disclosure of a stagger angle of approximately 29 degrees at the hub and a stagger angle of approximately 56 degrees at the tip and camber angle of approximately 29 degrees at the hub and approximately 12 degrees at the tip. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a stagger angle of approximately 29 degrees at the hub and a stagger angle of approximately 56 degrees at the tip and camber angle of approximately 29 degrees at the hub and approximately 12 degrees at the tip, since the claimed values are merely an optimum or workable range. It has been held that where the general conditions of a claim are

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disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With regard to claims 16 and 17 Von der Heide in view of Leupoldand further in view of Dehmer, Bradbury and Harmsen discloses the claimed invention except for rare earth magnet where the magnet comprises of bonded neodymium-iron-boron. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the rotor magnet of bonded neodymium-iron-boron. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See MPEP 2144.04.

With regard to claims 20-23 the determination of patentability in a product-by-process claim is based on the product itself, even though the claim may be limited and defined by the process. That is, the product in such a claim is unpatentable if it is the same as or obvious from the product of the prior art, even if the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985). Von der Heide in view of Leupoldand further in view of Dehmer, Bradbury and Harmsen discloses the product as claimed. A product-by-process limitation adds no patentable distinction to the claim, and is unpatentable if the claimed product is the same as a product of the prior art.

Claims 25, 26 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide in view of Leupoldand further in view of Herbert.

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Von der Heide in view of Leupold teaches the claimed invention as explained above except a finger guard. It would have been obvious to one of ordinary skill in the art to provide a fan finger guard, as fan finger guard are well known accessories and are available for most AC DC fans to protect the user as disclosed by Herbert (Col. 1 ll. 66-68 to Col. 2 ll. 1-9). With regard to claim 29 as shown in Von der Heide figure 2 top (top of housing 17) is perpendicular to the opposite sides of the fan housing 17 (two sides of the housing 17)

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide in view of Leupold and further in view of Herbert and further in view of Dehmer, Bradbury and Harmsen.

Von der Heide in view of Leupold and further in view of Herbert teaches the claimed invention as explained above except chord length stagger and camber angle.

Von der Heide in view of Leupold and further in view of Herbert teaches the invention substantially except the chord length. Dehmer teaches blade has a chord profile (Figure 3) that increases in chord length from a region proximate to the hub (bottom of figure 3) to a maximum chord length at a maximum chord length blade height (Figure 3); wherein the maximum chord length blade height is approximately half the full blade height (Figure 3, chord length increases towards the middle of the fan and is maximum around the middle); wherein each blade of the impeller has a tip and the chord profile decreases in chord length from the maximum chord length blade height to the tip of the blade (Figure 3 shows , chord length increases towards the middle of the fan and is maximum around the middle and then it decreases towards the upper end that is the tip

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of the blade). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Dehmer to increase the efficiency by minimize the losses generated by the fluid movement. (Col. 1 ll. 1-5). Von der Heide in view of Leupold and further in view of Herbert teaches the invention substantially except the stagger angle. Bradbury discloses blade that has a tip and the stagger angle of each blade increases from the hub to the tip of the blade (summary of invention paragraph 17). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Bradbury to increase the velocities on the surface and thus reducing the local pressure (summary of invention paragraph 19). Von der Heide in view of Leupold and further in view of Herbert teaches the invention substantially except the camber angle. Harmsen discloses camber angle that decreases from the hub to the tip (Col. 1 ll. 33-44). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Harmsen as a commonly known feature in the field of invention. (Col. 1 ll. 33-44).

Claims 9, 12 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen and in further view of Seki.

Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen except the solidity of approximately one. Seki discloses solidity of approximately one (Paragraph 55).). It would have been obvious to one of ordinary skill in the art at the

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time of invention to modify Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen and in further view of Seki to get to a solidity of approximately one because larger solidity decreases speed (paragraph 55).

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide in view of Leupold and further in view of Herbert and in further view of Seki.

Von der Heide in view of Leupold and further in view of Herbert except the solidity of approximately one. Seki discloses solidity of approximately one (Paragraph 55).). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Herbert and in further view of Seki to get to a solidity of approximately one because larger solidity decreases speed (paragraph 55).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen and further in view of Horng.

Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen except the second cooling fan in series. Horng discloses fans in series (Figure 1). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen and further in view of Horng for heat dissipation (Claim).

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen, Herbert and further in view of Horng. Von der Heide in view of Leupold teaches the invention substantially except the chord length. Dehmer teaches blade has a chord profile (Figure 3) that increases in chord length from a region proximate to the hub (bottom of figure 3) to a maximum chord length at a maximum chord length blade height (Figure 3); wherein the maximum chord length blade height is approximately half the full blade height (Figure 3, chord length increases towards the middle of the fan and is maximum around the middle); wherein each blade of the impeller has a tip and the chord profile decreases in chord length from the maximum chord length blade height to the tip of the blade (Figure 3 shows, chord length increases towards the middle of the fan and is maximum around the middle and then it decreases towards the upper end that is the tip of the blade). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Dehmer to increase the efficiency by minimize the losses generated by the fluid movement. (Col. 1 ll. 1-5). Von der Heide in view of Leupold teaches the invention substantially except the stagger angle. Bradbury discloses blade that has a tip and the stagger angle of each blade increases from the hub to the tip of the blade (summary of invention paragraph 17). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Bradbury to increase the velocities on the surface and thus reducing the local pressure (summary of invention

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paragraph 19). Von der Heide in view of Leupold teaches the invention substantially except the camber angle. Harmsen discloses camber angle that decreases from the hub to the tip (Col. 1 ll. 33-44). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Harmsen as a commonly known feature in the field of invention. (Col. 1 ll. 33-44). Von der Heide in view of Leupold teaches the claimed invention as explained above except a finger guard. It would have been obvious to one of ordinary skill in the art to provide a fan finger guard, as fan finger guard are well known accessories and are available for most AC DC fans to protect the user as disclosed by Herbert (Col. 1 ll. 66-68 to Col. 2 ll. 1-9). Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen except the second cooling fan in series. Horng discloses fans in series (Figure 1). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Von der Heide in view of Leupold and further in view of Dehmer, Bradbury and Harmsen and further in view of Horng for heat dissipation (Claim).

Response to Arguments

Applicant's arguments filed 12/10/2008 have been fully considered but they are not persuasive.

With regard to applicant's argument that claim limitation blades being at least 25 % of the impeller diameter it should be clear that "blades being at least 25 % of the impeller diameter" presents no novel or unexpected result over the blade and impeller diameter relationship (Also, applicant explains on page 10 and

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11 of the specification how the blade height ("HB") in the illustrated embodiment is approximately 25 % of the impeller diameter ("I"), as compared to 20 % of the impeller diameter in a fan using a conventional DC motor. This enables the impeller 72 to displace a greater amount of air for each rotation of the impeller than an impeller of a comparable fan powered by a conventional DC motor used in the references. Such a relationship between the blade height and the impeller diameter in lieu of those used in the references solves no stated problem and would be an obvious matter of design choice within the skill of the art.

In response to applicants argument and concern how a rare earth magnet is obvious to one of ordinary skill in the art it should be appreciated that rare earth magnets have been around for a long time and rare-earth magnets are strong, permanent magnets made from alloys of rare earth elements. Rare-earth magnets are substantially stronger than ferrite or alnico magnets. The magnetic field typically produced by rare-earth magnets can be in excess of 1.2 teslas. Ferrite or ceramic magnets typically exhibit fields of 50 to 100 milliteslas. Two common types of rare-earth magnets are:

Neodymium (neodymium-iron-boron)

Samarium-cobalt

Neodymium magnets (chemical formula: $\text{Nd}_2\text{Fe}_{14}\text{B}$) are the strongest and most affordable type of rare-earth magnet. Neodymium magnets are made of neodymium, iron and boron. For applicant's convenience and understanding Leupold reference has been added to the rejection. Leupold teaches a rare-earth permanent structure for

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producing magnetic field optimal for electric machinery. Leupold also teaches that Neodymium-Iron-Boron and Rare Earth Cobalts such as Samarium Cobalt or Cerium Cobalt, have been utilized or are being contemplated for use as MAGNETICALLY RIGID materials. The most pronounced characteristic of MAGNETICALLY RIGID materials is their very high coercivity (field magnitude required to demagnetize) relative to that of traditional magnetic materials. This characteristic may be viewed as the means by which various magnetic circuit effects can be attained with MAGNETICALLY RIGID materials that are unattainable with traditional magnetic materials, for example field transparency and flux path predictability.

With regard to applicant's argument that prior art does not disclose range of 24-30 degrees at the hub etc. as claimed. Von der Heide in view of Leupold discloses the general conditions of the claimed invention except for the express disclosure of the ranges claimed by the applicant. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a 24-30 degrees at the hub and 50-60 degrees at the tip, since the claimed values are merely an optimum or workable range. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

With regard to applicant's argument about the finger guard Von der Heide in view of Leupold teaches the claimed invention as explained above except a finger guard. It would have been obvious to one of ordinary skill in the art to provide a fan finger guard,

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as fan finger guard are well known accessories and are available for most AC DC fans to protect the user as disclosed by Herbert (Col. 1 ll. 66-68 to Col. 2 ll. 1-9).

With regard to applicant's argument that the pending claims must be given an interpretation that is reasonable and consistent with the specification, It should be noted that although operational characteristics of an apparatus may be apparent from the specification, this does not mean that such characteristics will be read into the claims when they cannot be fairly connected to the structure recited in the claims.

With regard to applicant's argument that there is lack of evidence to combine the reference, it should be clear that it is not required that the prior art disclose or suggest the properties newly-discovered by an applicant in order for there to be a prima facie case of obviousness. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. In this regard, a conclusion of obviousness may be based on common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in

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the art. In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Where a claimed improvement on a device or apparatus is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). Accordingly Applicant claims a combination that only unites old elements with no change in the respective functions of those old elements, and the combination of those elements yields predictable results; absent evidence that the modifications necessary to effect the combination of elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a).

Since the applicant[s] have submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a) because it is no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement.

Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art. Such ranges are termed "critical" ranges, and the applicant has the burden of proving such criticality. However, even though applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art. More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VIKANSHA S. DWIVEDI whose telephone number is (571)272-7834. The examiner can normally be reached on M-F, 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MICHAEL CUFF can be reached on 571-272-6778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Vikansha S Dwivedi/
Examiner, Art Unit 3741

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Supervisory Patent Examiner, Art Unit 3741